

## OCCURRENCE OF BLIND INSECTS IN SOUTH AFRICA.

BY A. RAFFRAY.

(Read October 30, 1895.)

In his presidential address, Dr. Marloth has expressed a regret that caves in South Africa have not been explored with a view to the discovery of such blind and bleached *Arthropoda* as are so peculiar a feature of the subterranean fauna of Europe and North America.

Probably Dr. Marloth's attention was not called to the fact that a French naturalist, Mons. E. Simon, an arachnologist of worldwide repute came to South Africa in 1892 and explored three caves in the Transvaal: one in the Pretoria district and two in Waterberg and Zoutspansberg. The result of his investigations has been published in the 'Annales de la Société Entomologique de France,' 1894, p. 64.

Mons. Simon has found in these caves some examples of the classes and orders *Thysanoura*, *Myriopoda*, *Arachnida*, and *Coleoptera*.

In the order *Coleoptera* he found—1. *Eurychora Simoni*, Fairm., a new species belonging to a genus peculiarly abundant in South Africa. This species has normal eyes, but it is light brown instead of black, and the colour thus resembles that of subterranean forms. 2. *Plagyopyga cyclogona*. This species was probably an occasional visitor to the cave.

In the class *Arachnida* he found—1. A *Loxosceles*, which he declares to be identical with the European species *L. speluncarum*, Duf., and which, I presume, inhabits European caves; this spider, however, is not blind. 2. A new genus, *Phyxelida makapensis*, Sim., belonging to a family which, hitherto, was not known to have cave-inhabiting representatives; this spider has also minute eyes.

The other *Arthropoda* have not yet been identified.

With the exception of *Loxosceles speluncarum*, these *Arthropoda* cannot be said to belong to a subterranean fauna.

I should, however, state that animals living in caves are not necessarily always blind or bleached in colour, more especially in the caves of tropical or subtropical countries.

Some years ago Mons. E. Simon explored some caves in the Philippine Islands, and his discoveries, which were much more numerous there than in South Africa, have been published in the

'Annales de la Société Entomologique de France,' 1892, p. 27. Two Coleoptera belonging to the family *Pselaphidæ* were examined by me and proved not to belong to a cavern-inhabiting form: one, *Tmesiphorus Simoni*, Raffr., has very large eyes, is dark in colour, and closely allied to a species abounding in the forests of Singapore; the second one, *Batrisus cavicola*, Raffr., shows relationship with some Australian forms, but the eyes are very small. It is the first time that a species of the very large genus *Batrisus* has been found in caves.

It is worthy of note that one of the insects found in the caves of the Pyrénées, in France, *Machærites Mariæ*, which has in all respects a subterranean facies, has well-developed, although small eyes, while in the female the eyes are exceedingly small and irregular, varying even in the same specimen. This peculiarity is in accordance with the fact that in many insects the eyes are smaller in the female than in the male.

Caves are not, however, the only localities where blind and bleached insects have been discovered. In the order *Coleoptera*, *Anillus*; *Scotodipnus*, *Reicheia* in the *Carabidæ*; *Apteranillus*, *Micrillus*, *Scotodytes* in the *Staphylinidæ*; *Amaurops* in the *Pselaphidæ*; *Raymondia*, *Crypharis*, and I believe *Troglorhynchus* in the *Curculionidæ*, as well as some others, have been found in Europe under big stones deeply embedded in the ground. I have myself discovered some of these very species in such a position in the South of France and in Algeria. With the exception of one *Anillus*, found in California, these insects seemed until quite lately to be confined to Europe. The difficulty of detecting these minute species may perhaps account for their not being recorded from other parts of the world, and my supposition seems to be justified by the discovery made by myself in Cape Town, and also in the neighbourhood of Cape Town (Newlands), of a *Scotodipnus* and a *Reicheia* belonging to the so-called subterranean genera.

*Scotodipnus capensis*, Pér., is very closely allied to its congener known from the South of France, Italy, and Corsica; it is an entirely blind insect, of pale, transparent colour, amber-like almost. It is found under stones at the foot of the Lion's Rump, near Cape Town, in the month of January. When the stone is turned over the insect is not detected at once, but if the muddy ground has remained attached to the under side of the stone, after a short exposition to the rays of the sun or to the daylight, *Scotodipnus*, who seems uneasy and disturbed by the heat, and possibly also by the light affecting its nervous system through the translucent teguments of the body, begins to move rather quickly and can then

be detected. This insect seems very rare; I found only two or three specimens last year, and four or five this year.

The second species, *Reicheia promontorii*, Pér., belongs to a genus known to occur in the South of France, Sicily, Algeria, Styria, Herzegovina, and Carylthia, in caves. I found this new South African species at Newlands on the slopes of the Devil's Peak, in sifting dead oak-leaves; it was fairly abundant.

*Reicheia promontorii* is not entirely blind; close to the insertion of antennæ is a small, black protuberance, which under a high magnifying power proves to contain a very small and rudimentary eye consisting of only one very convex facet, the diameter of which is  $\frac{3}{100}$  of a millimetre. The colour is darker than *Scotodipnus*, but still amber-like and not darker than in most of the true subterranean, cave-inhabiting beetles. I kept it alive so as to ascertain whether it was blind or not. Placed on a sheet of white paper, surrounded by a small barrier which it would have been very easy for the insect to surmount, *Reicheia* went straight forward, and quickly, until the antennæ came in contact with the obstacles; it would then stop, the antennæ vibrating quickly to try and ascertain what the barrier was. It would then go literally always in touch with the obstacle, as if it was hoping to find an aperture by means of which it would escape. This goes to show that the rudimentary eye is of very little use, if of any use at all.

It is now proved that subterranean forms occur in South Africa, and the wish so judiciously expressed by Dr. Marloth has been, or was already, partly fulfilled.

It is of interest to find that these subterranean insects show such a decided affinity to the European ones.

It cannot be said that *Scotodipnus* and *Reicheia*, through a special *modus vivendi*, similar to that obtaining in Europe, have been affected in their evolution, because both species have been found together with other minute beetles, decidedly peculiar to the Cape and quite characteristic of a fauna which is perhaps one of the best defined and most isolated, so far as we now know—and a good deal is known—in the world.

In South Europe and Algeria, so far as my experience goes, these insects live by themselves under very big stones where no other insects are found; at the Cape they are found under comparatively small stones and together with other insects.

This peculiarity of an isolated Cape entomological fauna has been already proved many times, and the best proof of it is afforded by the entomological collections of the South African Museum, which—I have no hesitation in saying it—are, so far as South Africa is concerned, the best and most extensive in the world.